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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,078	07/26/2005	Andrej Kitanovski	NITROS P171US	2645
20210 7590 10/26/2007 DAVIS & BUJOLD, P.L.L.C. 112 PLEASANT STREET CONCORD, NH 03301			EXAMINER DOERRLER, WILLIAM CHARLES	
			ART UNIT	PAPER NUMBER
			3744	
			MAIL DATE	DELIVERY MODE
			10/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/540,078

Applicant(s)

KITANOVSKI ET AL.

Examiner

William C. Doerrler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-40 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 21-36 is/are rejected.
- 7) ☒ Claim(s) 37-40 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6-23-2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21-27,30,31,33,35 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Mokadam (4,970,866).

Mokadam discloses circulating a fluid containing magneto-caloric particles into and out of a magnetic field to generate heat and cold, which is transferred to counter-current heat transfer fluids (shown in figures 1 and 4). Lines 17-34 of column 2 provide an overview of the system, including the use of gas or liquid and using a suspension as a multi-function fluid (to both generate the temperature change and transfer it to the heat transfer fluids. The fluid is seen as a nano-fluid due to the small size of the particles therein.

Claims 21-27,30,31,33,35 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Burnett (5,231,834).

Burnett discloses a magneto-caloric heat transfer system with electromagnets used to controllably magnetize a suspension of magneto-caloric particles which are circulated in

a fluid (see column 2 lines 54-65). The superconductive magnets are seen as electromagnets that generate a variable magnetic field. The fluid is seen as a nano-fluid due to the small size of the particles therein. As the suspension of the particles in the fluid is used to generate the temperature difference, and transport it to the heat transfer fluids in the heat exchangers, the fluid is seen as a multi-function fluid.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 28,29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Mokadam or Burnett.

Mokadam and Burnett each disclose applicants' basic inventive concept, a magneto-caloric heating and cooling method with a fluid of liquid with a suspension of magneto-

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caloric particles circulating through a magnetic field and a hot and cold heat exchanger, substantially as claimed with the exception of the size of the particles and using a permanent magnet. The size of the particles is seen as a matter of obvious design choice to an ordinary practitioner in the art, who would try to maximize the heat transfer from the system, while still ensuring the fluid can efficiently flow through the system. Permanent magnets are well known in the art and would have been obvious to an ordinary practitioner in the art to provide a magnetic field that is constant and does not require energy input to provide the magnetic field. Applicant has not provided any details or test results showing that any of the above provide non-obvious results are have a degree of criticality to the functioning of the system.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Mokadam or Burnett in view of Kahn.

Okadam and Burnett each disclose applicants' basic inventive concept, a heating and cooling method which circulates particles through a magnetic field and through hot and cold heat exchangers, substantially as claimed with the exception of using superconducting particles. Kahn shows the use of superconductors to provide a temperature difference by an alternating magnetic field to be old in the temperature change generation art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Kahn to use superconducting particles to generate a temperature change by flowing into and out of a magnetic field to provide a temperature change efficiently.

Allowable Subject Matter

Claims 37-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

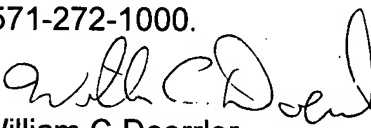
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Keefe shows a superconducting magneto-caloric system. Bennett et al show a nanocomposite magnetic refrigerant. Brown shows a magnetic fluid cooling system. Withers et al shows a nano-carbon material added to fluids to improve heat transfer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


William C Doerrler
Primary Examiner
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WCD